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chapter six

redesigning child care: survival, growth and development

The knowledge and effective interventions for reducing child mortality are available and technically appropriate to the countries and areas that need them most. This chapter says that what is now needed is to implement them to scale. Over the last half-century there has been a shift in focus from diseases to children, and from health centres alone to a continuum of care that implicates families and communities, health centres, and referral-level hospitals. Our understanding of the underlying skills that mothers need to care adequately for their children has grown and changed. As child health programmes continue to move towards integration, we need to move from small-scale projects to universal implementation that will also reach those children we are currently not reaching. Finally, the chapter provides the additional costs of scaling up that will be needed to reach all children with the appropriate interventions and meet the challenge of the Millennium Development Goal.

IMPROVING THE CHANCES OF SURVIVAL

The ambitions of the primary health care movement

During the 1970s, socioeconomic development and improved basic living conditions – clean water, sanitation and nutrition – were seen as the keys to improving child health. The primary health care movement, with its commitment to tackle the underlying social, economic and political causes of poor health, integrated this notion but outlined a strategy which would also respond more equitably, appropriately and effectively to basic health care needs. Along with intersectoral action for health, community involvement and self-reliance, primary health care stood for universal access to care and coverage on the basis of need. Much of the primary health care strategy was designed with the health of children as the priority of priorities.

The ambitions of the primary health care movement were vast. To implement its strategy, resources would have had to be redistributed, health personnel reoriented and the whole design, planning and management of the health system overhauled. This was clearly a long-term endeavour that would have required a major increase in funds being made available to the sector.

The successes of vertical programmes

The economic situation at the end of the 1970s, however, did not allow for such a development. Setting up primary health care systems in a context of shrinking resources was a daunting task. While countries struggled with the complexities of long-term socioeconomic development,

child health – and particularly child survival – was such an obvious emergency that pressure for immediate action mounted. Therefore, by the early 1980s, many countries shifted their focus from primary health care systems to vertical, "single-issue", programmes that promised cheaper and faster results.

The most visible illustration of this shift was the Child Survival Revolution of the 1980s, spearheaded by the United Nations Children's Fund (UNICEF), and built around a package of interventions grouped under the acronym GOBI (growth monitoring, oral rehydration therapy for diarrhoea, breastfeeding, and immunization). Donors and ministries of health responded enthusiastically, particularly to initiatives prioritizing immunization and oral rehydration therapy. Many countries set up programmes for this purpose. Like the malaria and smallpox programmes of the 1950s and 1960s, each one had its own administration and budget and a large amount of autonomy from the conventional health care delivery system.

These programmes benefited from the support of dedicated programmes within WHO: the Expanded Programme on Immunization of the mid-1970s, and, later, those created to reinforce national programmes for Control of Diarrhoeal Disease and Acute Respiratory Infections. At country level these vertical programmes successfully tackled a number of priority diseases.

The Expanded Programme on Immunization started in 1974 and widened the range of vaccines routinely provided, from smallpox, BCG and DTP to include polio and measles. It set out to increase coverage in line with the international commitment to achieve the universal child immunization goal of 80% coverage in every country. The 1980s did indeed see a huge increase in coverage (see Figure 2.2 in Chapter 2). In 1988, when the World Health Assembly resolved to eradicate polio, there were some 350 000 cases worldwide; by January 2005 there were only 1185 cases reported. Thanks to sustained efforts to promote immunization, deaths from measles decreased by 39% between 1999 and 2003 *(1)*; compared to levels in 1980, measles mortality has declined by 80%. Efforts continue to increase coverage and widen the range of vaccines provided. The vaccination schedule is under constant revision as new vaccines become available, for example those against Hepatitis B and *Haemophilus influenzae* type b, and, in the near future, rotavirus (diarrhoea) and pneumococcus (pneumonia).

These vertical programmes used a combination of state-of-the-art management and simple technologies based on solid research. The prototype for this was oral rehydration therapy, the "medical discovery of the century" *(2, 3)* – a cheap and effective way to tackle mortality from diarrhoea. Widespread introduction of oral rehydration therapy largely contributed to reducing the number of deaths due to diarrhoea from 4.6 million per year in the 1970s to 3.3 million per year in the 1980s and 1.8 million in 2000.

As mortality from diarrhoea and vaccine-preventable diseases decreased, pneumonia came to the foreground as a cause of death, and in the early 1980s programmes were developed around simplified diagnostic and treatment techniques. In the meantime promotion of breastfeeding continued, backed up by international initiatives such as the International Code of Marketing of Breast-milk Substitutes (adopted by the World Health Assembly in 1981) and the Global Strategy for Infant and Young Child Feeding (endorsed by the World Health Assembly and by the UNICEF Executive Board in 2002). Advances were made possible by new insights into the optimal duration of exclusive breastfeeding and feeding for babies born to HIV-infected women. Countries widely implemented the Baby-Friendly Hospitals initiative to support promotion of

breastfeeding in maternities. In 1990, less than one fifth of mothers gave exclusive breastfeeding for four months; by 2002 that figure had doubled to 38%.

Some countries had impressive successes with such programmatic approaches, and went beyond the small number of priority programmes that had international attention. Tunisia, for example, used the managerial experience gained in its first successful programmes to expand the range of health problems addressed, organizing delivery of these programmes through its network of health centres and hospitals. The country reduced the under-five mortality rate by 50% between 1970 and 1980, 48% between 1980 and 1990 and 46% between 1990 and 2000.

TIME FOR A CHANGE OF STRATEGY

Combining a wider range of interventions

For all their impressive results, the inherent limitations of these vertical approaches soon became apparent. In their daily practice health workers have to deal with a large range of situations and health problems. A feverish and irritable child that has difficulty eating can be suffering from a single illness, such as dysentery, or from a combination of diseases, such as malaria and pneumonia *(3–8)*. Single-issue programmes were not designed to provide guidance on how to deal with such situations. There was

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In 1988 when the World Health Assembly resolved to eradicate polio, there were some 350 000 cases worldwide; by January 2005 there were only 1185 cases reported.

Box 6.1 What do children die of today?

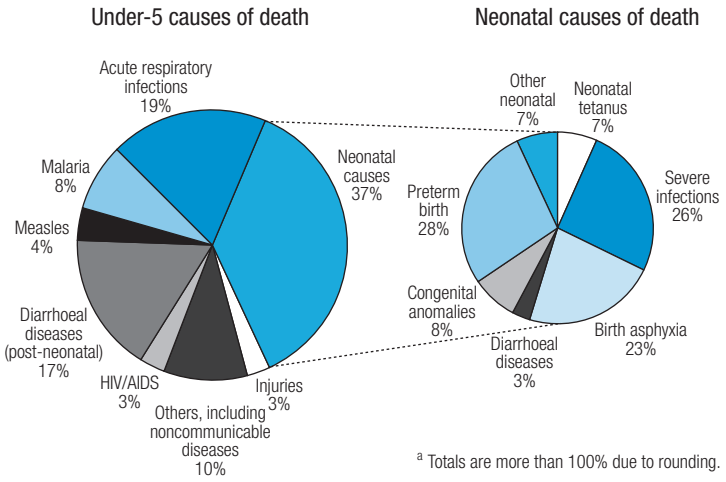
Despite the substantial reductions in the number of deaths observed in recent decades, around 10.6 million children still die every year before reaching their fifth birthday. Almost all of these deaths occur in low-income and middle-income countries. A global picture of what these children die from has emerged during the past few years in a collaborative effort between WHO, UNICEF, and a group of independent technical experts, the Child Health Epidemiology Reference Group (CHERG).

Most deaths among children under five years are still attributable to just a handful of conditions and are avoidable through existing interventions. Six conditions account for 70% to over 90% of all these deaths. These are: acute lower respiratory infections, mostly pneumonia (19%), diarrhoea (18%), malaria (8%), measles (4%), HIV/AIDS (3%), and neonatal conditions, mainly preterm birth, birth asphyxia, and infections (37%).

Malnutrition increases the risk of dying from these diseases. Over half of all child deaths occur in children who are underweight. The relative importance of the various causes of death has changed with the decline in mortality from diarrhoea and many of the vaccine-preventable diseases. The relative contribution of HIV/AIDS to the total mortality of children under five years of age, especially in sub-Saharan Africa, has been increasing steadily: in 1990 it accounted for around 2% of under-five mortality in the African Region, but in 2003 the figure had reached about 6.5%.

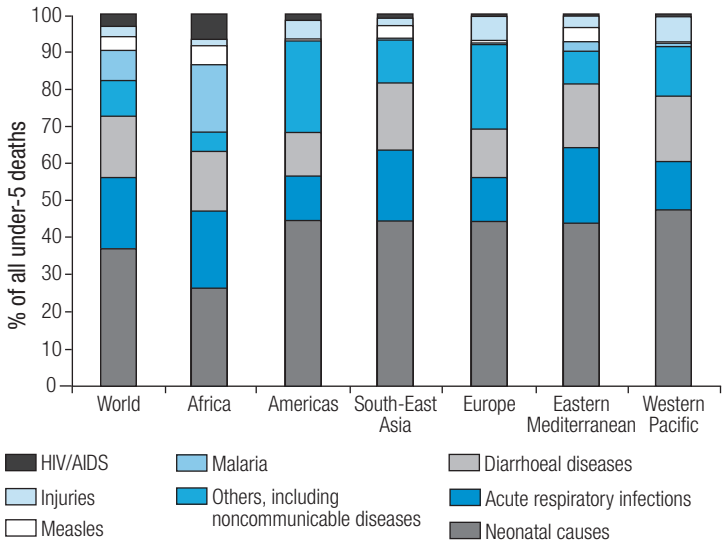
Summarizing data across regions and countries masks substantial differences in the distribution of causes of death. Approximately 90% of all malaria and HIV/AIDS deaths in children, more than 50% of measles deaths and about 40% of pneumonia and diarrhoea deaths are in the African Region. On the other hand, deaths from injuries and noncommunicable diseases other than congenital anomalies account for 20–30% of under-five deaths in the Region of the Americas and in the European and Western Pacific Regions.

The causes of death of children under five, 2000–2003[a]



[a] Totals are more than 100% due to rounding.

Major causes of death among children under five, by WHO region, 2000–2003



clearly a need for a more comprehensive view of the needs of the child, one that would correspond to problems as they were encountered in the field *(4)* and would offer a wider range of responses than the existing programmes. These had been designed to target the most important causes of death and, partly as a result of their success, the profile of mortality was changing. Diarrhoea, for example, now causes 18% of childhood deaths, as opposed to 25% in the 1970s (see Box 6.1).

The response to this new situation was to package a set of simple, affordable and effective interventions for the combined management of the major childhood illnesses and malnutrition, under the label of "Integrated Management of Childhood Illness" (IMCI). IMCI combines effective interventions for preventing death and for improving healthy growth and development: oral rehydration therapy for diarrhoea; antibiotics for sepsis, pneumonia, and ear infection; antimalarials and insecticide-treated bednets; vitamin A, treatment of anaemia, promotion of breastfeeding and complementary feeding for healthy nutrition and for recovery from illness, and immunization. Some countries have included guidelines to treat children with HIV/AIDS, others for dengue fever, wheezing, or sore throat, or for the follow-up of healthy children.

Dealing with children, not just with diseases

The second justification for a more comprehensive approach was the recognition that the health of children is not merely a question of targeting a limited number of diseases that are immediate causes of mortality.

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Packaging simple, affordable and effective interventions. Here, a Vietnamese boy is vaccinated.

As appropriate technologies became more widely available, a gradual evolution also took place in the content and methods of communication between health workers and parents. Previously, a family who brought a child for curative care had generally received basic treatment with minimal instruction and explanation for use of prescribed treatments at home. The introduction of oral rehydration therapy, however, added a new element to the relationship between the family and the clinic. During the clinic visit, families now learnt how to prepare and give oral rehydration salts solution *(9–11),* to recognize signs of illness, and to treat their children without delay at home; they also learnt to make use of fluids available in the home, to make treatment more accessible. This led to the development of a systematic process of advising and counselling, and to new partnerships between health workers and households.

Child health programmes see many malnourished children. Some of these children may be malnourished as a result of lack of access to food, but more often it is because of infection and poor feeding practices, or a combination of the two *(4, 12)*. Counselling on feeding practices naturally became an element of IMCI. As with oral rehydration therapy, this forced health workers to enter into a different kind of partnership with mothers. It was no longer a matter of asking a few simple questions and prescribing a treatment: feeding problems had to be identified and acceptable solutions negotiated with the mother. Counselling carried out in this way requires specific training for the health worker, and the right kind of environment, but it is more effective *(13, 14)*.

The next logical step was to pay more attention to the physical and psychosocial development of children. A child's health and development is strongly influenced by the relationship between child, parents and other caregivers. The key is for the caregiver to be receptive to the child's state and needs, to interpret them correctly and be quick to react appropriately *(15)*. This is a critical factor in healthy growth *(16–19)*; the absence of sensitive, responsive care is associated with malnutrition and failure to thrive *(20–22)*. The influence of such care on healthy cognitive and social development as well as on survival has been well documented *(18, 23)*.

New evidence accumulated during the 1990s shows that mothers can be helped to communicate better with and to stimulate their young children *(24)*. The skills needed for appropriate feeding, psychosocial care and care-seeking are closely linked *(24)*, and improving one of these positively influences the others. Sensitivity and responsiveness can be effectively promoted and taught to caregivers, even in difficult social and economic conditions, or when a mother's ability to care for her child is compromised by depression *(24)*. Specific efforts are required to work with foster-parents, or with children who are heads of households. The challenge is to integrate these new findings into public health programming.

Parents are naturally concerned about the growth and psychosocial development of their children; however, health workers who operate in resource-constrained environments have long considered this more of a luxury or something that they could not influence. IMCI changed that: in doing so it created new challenges for what was no longer just a technical programme but became a partnership between parents and health workers.

ORGANIZING INTEGRATED CHILD CARE

The notion of integration has a long history. Integration is supposed to tackle the need for complementarity of different interdependent services and administrative structures, so as to better achieve common goals. In the 1950s these goals were defined in terms of outcome, in the 1960s of process and in the 1990s of economic impact

(25–27). Integration has different meanings at different levels *(28)*. At the patient level it means case management. At the point of delivery it means that multiple interventions are provided through one delivery channel – for example where vaccination is used as an opportunity to provide vitamin A and insecticide-treated bednets during "EPI-plus" activities, boosting efficiency and coverage *(29, 30)*. At the system level integration means bringing together the management and support functions of different sub-programmes, and ensuring complementarity between different levels of care. IMCI is now the only child health strategy that aims for improved integration at these three levels simultaneously.

IMCI has successfully integrated case management and tasks in first-level facilities by providing health workers with guidelines, tools and training. Progress towards integration between different levels is facilitated by the complementary guidelines for case management at first-level and referral facilities. Health workers at first-level facilities have guidelines for referring severely ill newborns and children, as well as those with complex problems. Health workers at the district hospital in turn get the guidelines and training to manage these referred children.

IMCI has gone a step further. More than just adding more programmes to a single delivery channel, it has sought to transform the way the health system looks at child care. IMCI retained its original name, but with the ambition of going beyond the management of illness *(3, 5, 31, 32)*. Based on experience from single-issue programmes, IMCI designed an approach with three components: improving the skills of health workers, strengthening the support of health systems, and helping families and communities to bring up their children healthily and deal with ill-health when it occurs. In doing so, IMCI had to move beyond the traditional notion of a health centre's staff providing a set of technical interventions to their target population.

Households and health workers

As they increasingly entered into dialogue with households, health workers in child programmes realized how crucial what happens in the household is for the health of a child. Food, medicine and a stimulating environment are all necessarily mediated by what households and communities do or do not do. When a child is ill, for example, someone in the household must recognize that there is a problem, provide appropriate care, identify signs indicating that the child needs medical care, take the child to a health worker, work out a proper course of action with the health worker (which may be to obtain medication and comply with the instructions on how to use it, or to take the child to hospital), provide support during convalescence, and return to the health worker if necessary. Households and communities thus determine whether the health system's intervention can make a difference. Without all this, even the best health centre will get poor results. To look at child health from this perspective may seem obvious today, but for the vertical programmes of the 1980s this was a radical change. It stimulated a flurry of interest in how households can contribute to the improvement of the health of their children: the so-called "key family practices" summarized in Box 6.2.

These family practices tackle behaviour that promotes physical growth and mental development, and prevents illness. The importance of this is obvious and has long been recognized. What is new is that seeking care from health services is also considered to be one of the ways households contribute to the health of their children. Poor or delayed care-seeking contributes to up to 70% of child deaths *(33)*. Most children die at home, and many without prior contact with competent medical care.

Promoting appropriate care-seeking and ensuring that health facilities are accessible are therefore crucial. The potential of appropriate home care, whether by the caregiver or by a lay community worker, is also increasingly recognized. For example, home management of malaria can reduce the incidence of severe malaria and malaria mortality, as experience in Burkina Faso and Ethiopia has shown *(34, 35)*. Prompt antibiotic treatment of pneumonia by well-trained and supervised community health workers can substantially reduce pneumonia-related mortality *(36)*.

Recognizing the importance of what households do is one thing, identifying how they can be helped to do so is another *(37)*. One approach is to improve the communication skills of health workers. Experiences in Brazil and the United Republic of Tanzania show that this results in improved care by families in the home *(13)*. Another approach is to work through community development programmes. In Bangladesh, for example, training of health workers in combination with community activities tripled the uptake of services from 0.6 to 1.8 visits per child per year *(38)*. While households carry the primary responsibility for what they do or do not do at home, the health system needs to enable households to meet these responsibilities. This is not a simple question of health education, but a more complex process of empowerment, for which the health worker also needs to change his or her way of working *(38)*.

With the support of a responsive health system, much can be done. In Makwanpur, Nepal, for example, women's groups supported by a facilitator discussed what factors contributed to perinatal mortality in their own living environment and formulated strategies to deal with them. This improved the way newborns were cared for at home and the appropriate use of health services, leading to a reduction of neonatal mortality *(39)*.

Box 6.2 How households can make a difference

Households can promote **physical growth and mental and social development** by ensuring exclusive breastfeeding for six months, by starting complementary feeding at six months of age and continuing breastfeeding until the child is aged two years or more. They can ensure that children receive adequate amounts of micronutrients either in their diet or through supplementation. They can also respond to a child's needs for care through talking, playing and providing a stimulating environment. The entire household, including men, has a role to play.

Households and communities can help **prevent child abuse and neglect**, and can take appropriate action when it has occurred.

Households can improve adequate **uptake of health care services** by recognizing when sick children need treatment outside the home and seeking timely care from appropriate providers. It is important for households to take children as scheduled to complete a full course of immunizations before their first birthday, and to follow health workers' advice about treatment, follow-up and referral.

Households can improve **care for sick children at home** by continuing to feed and offer more fluids (including breast milk) to children when they are sick, by giving them appropriate home treatment for infections, and by taking appropriate action in case of injury or accidents.

Households can **prevent illness** by disposing of faeces safely, and by washing hands after defecation, before preparing meals and before feeding children. They can bring their children for vaccination. In malaria-endemic areas they can ensure that children sleep under insecticide-treated bednets. Households and communities can take measures to prevent injuries and accidents.

Much depends, though, on the environment in which members of poor households live. An example is indoor air pollution. Half of the world's population rely on dung, wood, crop waste or coal to meet their most basic energy needs. In the highlands of western Guatemala, for example, most households use an open fire, fuelled by wood, for cooking and heating. Cooking with these so-called solid fuels leads to levels of particulate matter that are 100 times higher than typical outdoor air concentrations in European cities. With little ventilation, the smoke makes breathing difficult, burns the eyes and covers the dwelling in black soot. Young children, often carried on their mothers' backs during cooking, are most exposed. Moreover, women and children often spend many hours collecting fuel – time that could be spent on education, child care or income generation. Lack of a good source of lighting limits educational activities beyond daylight hours.

In the short term, well-designed stoves with chimneys can significantly reduce emissions and help protect children. But to reduce indoor air pollution drastically, it is necessary to switch to cleaner and more efficient fuels: liquid petroleum gas, electricity or solar power. Poor households often do not have the resources to do so, and this situation will continue until the roots of poverty are tackled.

In Haryana, India, health workers provided counselling during immunization sessions and curative care consultations, while community health workers did the same during weighing sessions and home visits. This increased exclusive breastfeeding at three months, reduced rates of diarrhoea *(40)*, improved complementary feeding practices at nine months of age *(41)*, and increased uptake of curative and preventive health care services *(42)*.

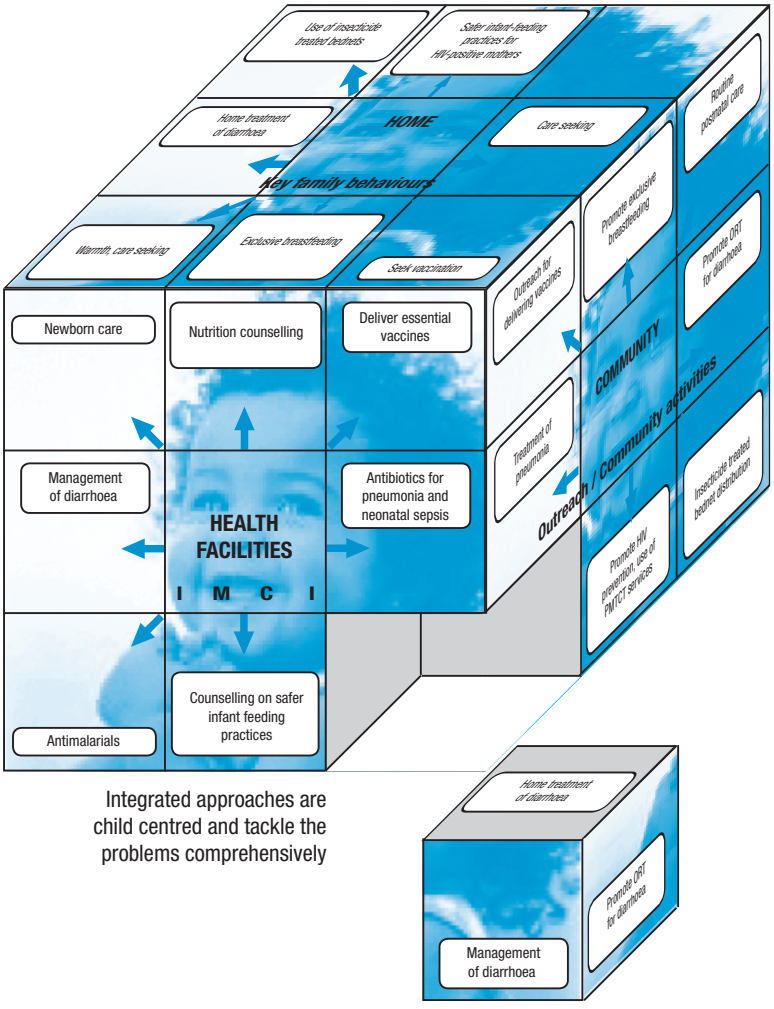
IMCI has focused much of its training and capacity-building efforts on the first contact level: the health centre, and the nurse or doctor who first sees the sick child. For IMCI to work optimally, it has to build the continuum of care in two directions: towards facilitating referral, and towards bringing care closer to households, and thus to children (see Figure 6.1).

Referring sick children

The focus on primary health care and, more recently, on the role of households themselves, has often meant that child health programmes have overlooked how important it is to be able to refer a sick child to a well-functioning hospital. This is important for the child and the child's family, but also for the front-line health workers; it can have a substantial impact on child mortality *(43)*. Facilitating referral is straightforward, at least in principle, if a district system has been put in place. It does, however, depend on removing delays and obstacles that are not always considered to be part of the health worker's responsibilities.

Deaths in hospital often occur within 24 hours of admission. Many of these deaths could be prevented if good-quality care were provided in good time. To achieve this, dangerous delays must be avoided: first, by helping mothers or other caregivers identify early the signs which show that children need medical attention; second, by ensuring that public health services are open when they are needed, such as when parents are home from the fields or from work, and when children feel ill (often in the evening); third, by making sure that health workers refer promptly when there is an indication to do so. Implementation of IMCI guidelines should result in referral of 10% of children aged between two months and five years *(44, 45)*. In many of the countries that have made little or

Figure 6.1 An integrated approach to child health



no progress in terms of child health, there is a substantial amount of under-referral, particularly in rural areas, and the referral rates one would expect from the IMCI guidelines are rarely reached.

A further source of delay is the journey to hospital, a problem for which many health workers do not feel they are responsible. Yet problems can be avoided in many cases if they are anticipated. Health workers can help to organize transport and to find arrangements for the other children and domestic duties while parents take a child to the hospital.

Finally, much can de done to reduce delays in starting appropriate treatment within hospitals *(46, 47)*. In Malawi, for example, the number of deaths before admission was reduced from 10 per month to five as a result of rapid triage as soon as the child arrived. Inpatient mortality was brought down from 11–18% to 6–9%, with improved staff morale as an added bonus. Management of severe malnutrition *(48–50)* and of pneumonia *(51)*, as well as neonatal care *(52)* can be substantially improved with better ward organization, clinical guidelines and standards, active staff participation, and (often limited) additional resources *(53)*.

Bringing care closer to children

More difficult, and perhaps more important, is to bring care closer to the children. The familiar answer is outreach. For health workers to visit households and communities in their catchment area is probably the fastest way to scale up coverage with interventions that can be planned, such as vaccination. The drawback, though, is that it cannot provide the full range of services needed to improve child health and survival. The potential of this mode of delivery to scale up coverage is very variable from place to place, but probably big on a global scale, particularly for population groups that are currently excluded.

The less familiar way is to empower households, and help them take better care of their children. Health workers tend to be less comfortable with this kind of approach. They are understandably reluctant to relinquish parts of their professional prerogatives, and they do not know how to do so. Classic health education to obtain changes in behaviour has only a limited potential, and many health workers have experienced this. Empowerment is much more challenging than health education: it requires time, and an attitude that is new and has to be learnt.

Community health workers can function as a bridge between health centre and households where the health centre network is not readily accessible. In Ethiopia, for example, community health workers diagnose and treat fever. This has increased the coverage of malaria treatment services well beyond the reach of many health facilities. From 1991 to 1998, the number of febrile patients receiving antimalarials steadily increased from 76 000 to 949 000 *(54)*. In Pakistan, Lady Health Workers are a pivotal component of the national health system. They are selected and supported by the government, and provide basic primary health care services, including home visits, to the community in which they live. The programme covers approximately one fifth of the population *(55)*. Such programmes can boost coverage; by themselves, however, they are no substitute for extending the health care network and helping the households themselves to take care of their children better.

ROLLING OUT CHILD HEALTH INTERVENTIONS

IMCI has now been adopted by more than 100 countries. The guidelines are designed for adaptation at national and sub-national levels. The establishment of task forces

at national level to adapt the guidelines to national contexts has created ownership and helped overcome problems with, for example, the availability of essential drugs. Where IMCI has been evaluated, results are on the whole positive. Training has led to improved health worker performance and quality of care, without increasing costs. For example, IMCI-trained health workers in Uganda and the United Republic of Tanzania gave correct treatment with antibiotics or antimalarials to much larger proportions of children than their colleagues, and prescribed fewer antibiotics to children not needing them *(56)*. The impact is impressive: in the United Republic of Tanzania, in a setting where utilization of health services was high, IMCI implementation reduced mortality by 13% over a two-year period, compared with control districts, and indications are that results may further improve over a longer period.

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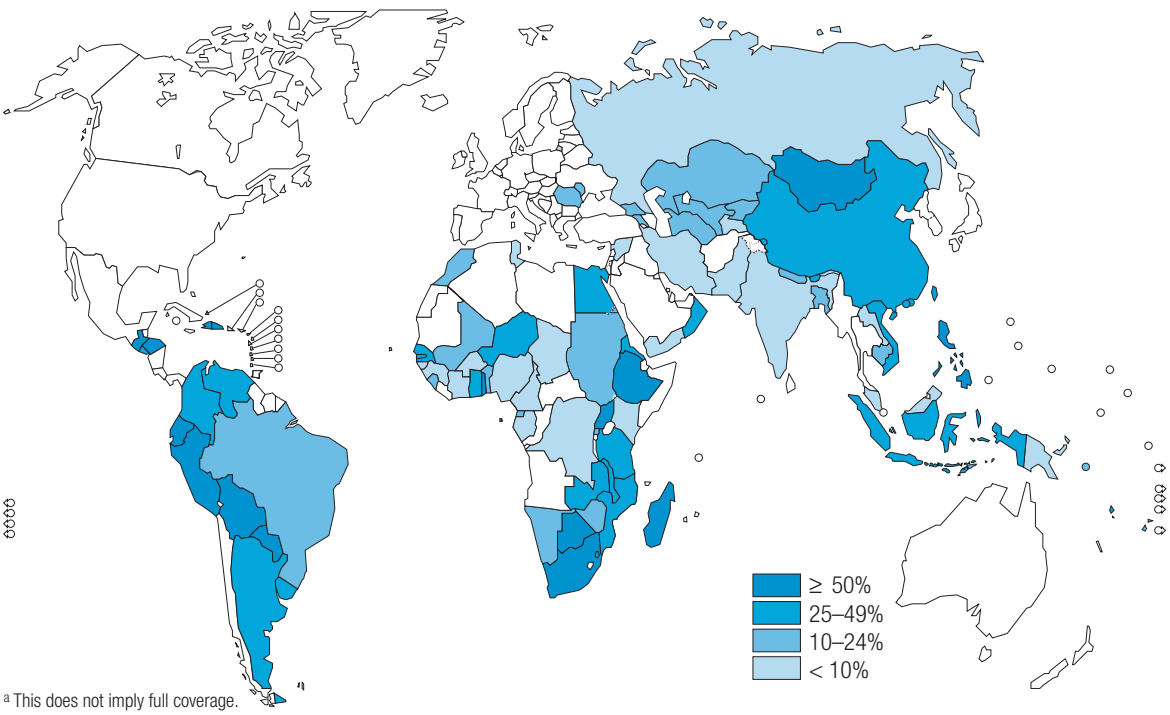
For the Integrated Management of Childhood Illness (IMCI) to work optimally, it has to build a continuum of care that extends through families and communities, first-level facilities and hospitals.

However, the expansion of IMCI has proceeded more slowly than expected. Only 16 out of 100 countries had started implementation in more than 50% of their districts in 2003; moreover, most have focused on improving health worker skills, and little has usually been done to strengthen health systems or empower households *(57, 58)*. This can be explained in part by the slow development of district health care systems, particularly in the countries most in need of scaling up IMCI (see Chapter 3). IMCI fits perfectly with the district concept, giving the same central place to the health centre, considering the continuum of care in the same terms, and with the same balance between responding to epidemiology and responding to demand. The downside is that it is subject to the same constraints: infrequent or inadequate supervision, rapid turnover and low morale of staff, a culture of non-responsiveness, and underfunding *(59)*.

A second reason for the slow expansion of IMCI results from its emphasis on integration and horizontality. In its insistence on full integration at the point of delivery, IMCI has dismantled or weakened pre-existing organizational structures of vertical programmes *(60)*, and has in the process lost the programmatic visibility that allowed these to thrive and attract funding. The absence of full-time coordinators, operational plans or specific budget lines hampered sustained implementation *(60)*. The lesson learnt is that a careful trade-off is required between integrating at point of delivery and maintaining the programmatic structures that define the technical norms and standards, drive expansion of coverage and provide a logistic platform. It requires considerable capacity and skills to integrate immunization services, for example, within the local political, social and health infrastructure, while at the same time protecting strategic elements within existing national and regional strategic plans and

Figure 6.2 Proportion of districts where training and system strengthening for IMCI had been started by 2003[a]



[a] This does not imply full coverage.

workplans. One of the strategies to facilitate this is to plan coverage on a district-by-district basis, as some countries do in the Reaching Every District initiative launched in 2002. It combines the re-establishment of outreach services, supportive supervision, community links with service delivery, monitoring and use of data for action, and planning and management of resources. To date more than 30 countries in four WHO regions have adopted this strategy, and plan and monitor vaccination coverage on a district-by-district basis.

The reality is that today many children do not yet benefit from comprehensive and integrated care. They are even excluded from the care necessary to ensure survival – that is, the core interventions around which IMCI is built.

Scaling up a set of essential interventions to full coverage (see Table 6.1) would lower sufficiently the incidence and case-fatality of the conditions causing children under five years of age to die, to allow progress towards and beyond the Millennium Development Goals.

Table 6.1 Core interventions to improve child survival

- **Nurturing newborns and their mothers:** skilled attendance during pregnancy, childbirth and the immediate postpartum period (not costed in this chapter).
- **Infant feeding:** exclusive breastfeeding during the first six months of a child's life, with appropriate complementary feeding from six months and continued breast-feeding for two years or beyond, with supplementation with vitamin A and other micronutrients as needed.
- **Vital vaccines:** increased coverage of measles and tetanus vaccines, as well as immunization against common vaccine-preventable diseases.
- **Combating diarrhoea:** case management of diarrhoea, including therapeutic zinc supplementation and antibiotics for dysentery.
- **Combating pneumonia and sepsis:** case management of childhood pneumonia and neonatal sepsis with antibiotics.
- **Combating malaria:** use of insecticide-treated bednets, intermittent preventive malaria treatment in pregnancy, and prompt treatment of malaria.
- **Prevention and care for HIV:** treatment, care, infant feeding counselling and support for HIV-infected women and their infants.

THE COST OF SCALING UP COVERAGE

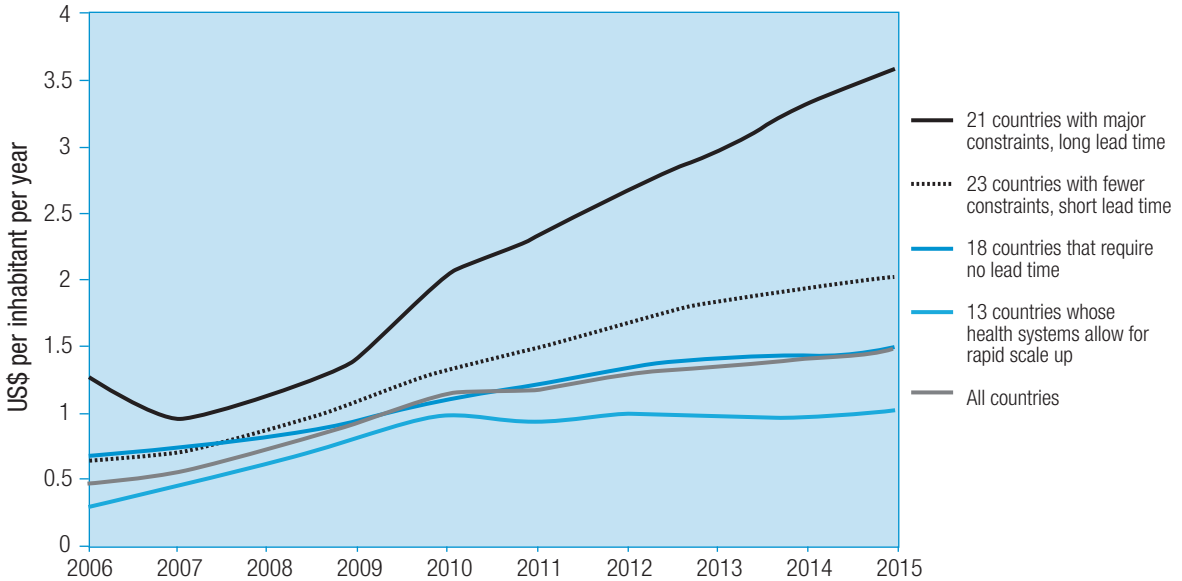
One of the major challenges the world faces is to scale up these interventions to full coverage as soon as possible. Theoretically it is possible to fill the gap between present levels and near-universal coverage within the next 10 years. In some countries the coverage gap is relatively small and the health system strong enough to bridge it quickly. In others the challenge is much greater, all the more so as health systems there are less developed and more fragile. Even in these cases, however, it is possible to reach full coverage through a combination of extension of the health care network, stepped-up outreach and, in some situations and for some interventions, by relying on lay community health workers.

Scaling up interventions to full coverage will not, however, be possible without massively increasing expenditure on child health. From the perspective of planning and resource mobilization it is crucial to be aware of the additional costs that will be entailed (over and above current levels of expenditure).

For the 75 countries that together account for almost 95% of child deaths in the world, it is possible to formulate scenarios for scaling up each of the interventions to 95% coverage between 2006 and 2015. Such countries include those with the highest numbers of child deaths and those with the highest under-five mortality rates; they comprise all the countries in which the mortality rates of children under five years of age have been stagnating or reversing during the 1990s, as well as many of those making slow progress or which are already well on track. Together they have a population of around 4.6 billion (in 2005), including 496 million children under five years of age. These countries have been classified in four groups using a set of criteria that include the level of mortality, the strengths and weaknesses of the health system, and the challenges imposed by the environment in which they operate. For each country a group-specific scenario for scaling up coverage was applied to current levels of coverage with each intervention.

The sum of the additional costs for implementing these scaling-up scenarios is estimated to be at least US$ 52.4 billion: US$ 2.2 billion in 2006 increasing, as coverage expands, to US$ 7.8 billion in 2015. This corresponds to US$ 1.05 per inhabitant per year (US$ 0.47 initially, increasing to US$ 1.48 in year 10, when 95% of the child population would be covered with the full range of interventions in every country). This in turn corresponds to an average increase of 12% per year of current median public health expenditure in the 75 countries, which is currently around US$ 8.4 per inhabitant (see Figure 6.3 and Box 6.3). Assumptions and methods for the costing exercise are summarized on the *World Health Report* web site (http://www.who.int/whr). Countries in the two groups in which the starting situation is relatively

Figure 6.3 Cost of scaling up child health interventions, additional to current expenditure



favourable, but where labour, drugs and supplies are more expensive, account for 60% of the global price tag of US$ 52.4 billion. Approximately US$ 21 billion would be required in the countries in the two groups where conditions are currently most challenging. These are low-income countries with high mortality levels, low coverage and relatively weak health systems – but where the current prices of labour and supplies are lower.

In the 13 middle-income countries that belong to the group currently in the most favourable situation, expenditure on child health would have to increase by US$ 0.79 per inhabitant per year on average (US$ 0.29 at the beginning, rising over time to US$ 1.01). This corresponds to an increase of 3% per year (1% at the beginning, rising to 4% in 2015) of current median public expenditure on health in these countries, which is around US$ 23 per inhabitant.

Low-income countries in the group where the situation is currently most difficult, such as Angola, Chad, Côte d'Ivoire, the Democratic Republic of the Congo, Ethiopia, Mali, Niger, Nigeria and Somalia, would have to spend US$ 2.16 per inhabitant per year on top of current expenditure: US$ 1.27 in the early years and, as they move towards full coverage, US$ 3.58 per inhabitant per year 10 years later. This corresponds to a 46% growth (27% to start with, rising to 76% in 2015) of current median public expenditure on health in these countries, which is around US$ 4.7 per inhabitant (the median private expenditure in these countries is US$ 5.5 per inhabitant per year).

These estimates are only as good as the assumptions and projections underlying them. In some countries scaling up can go faster than projected, in others it will be slower: much depends on political will and commitment, and on the social, political and economic contexts. Population dynamics may change, as well as cost structures. Technical innovations and changes in patterns of health care provision and human resource availability may influence coverage expansion as well as cost estimates. Furthermore, the cost projections currently do not take account of the effects of scaled-up intervention sets on changes in disease epidemiology and do not include gains in efficiency that would derive from integration of the different interventions at the point of delivery.

Nevertheless, these projections provide a benchmark for the additional cost, on top of current expenditure, of a massive scale up. It is a low-end benchmark, because it assumes that current coverage levels can be sustained without additional investments, and that there are no constraints to the capacity to produce supplementary staff and infrastructure. Furthermore, it does not account for the cost of training new multipurpose health professionals involved in child care, nor for the increases in salaries and other benefits that in many countries are necessary to redeploy and motivate staff.

FROM COST PROJECTIONS TO SCALING UP

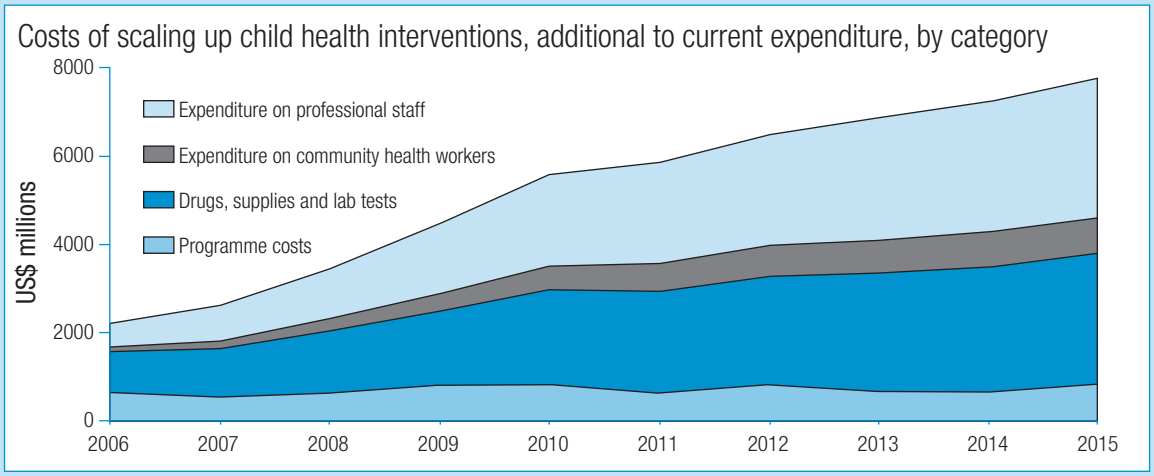
Every country faces unique challenges in increasing access to care and coverage, but all will need a sustained political commitment to mobilize the considerable resources that are required. While such a financing effort seems to be within reasonable reach in some countries, in many it will go beyond what can be borne by governments alone. Relying on increased out-of-pocket expenditure for mobilizing such resources seems unrealistic in many countries; to do this through increased public spending is more realistic in others, but in many cases the additional cost is such that external assistance will be necessary.

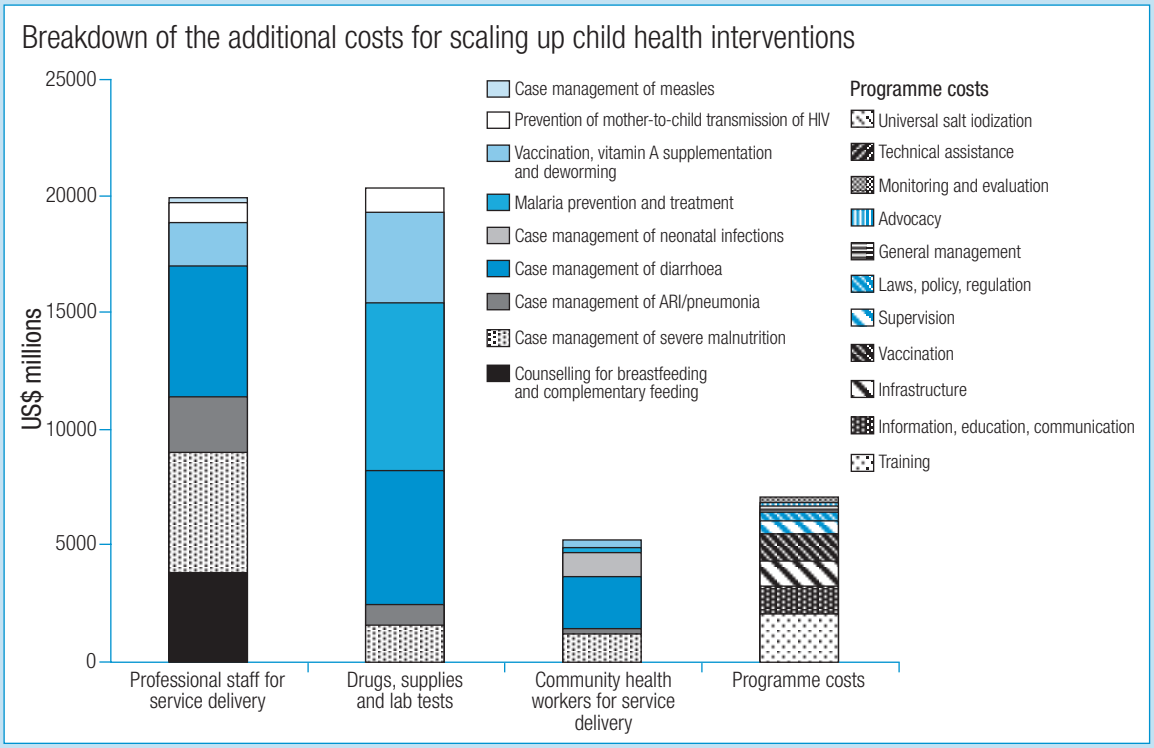
Box 6.3 A breakdown of the projected cost of scaling up

Increasing coverage means that more children and households have to be reached. The result is that the cost of scaling up coverage, additional to current levels of expenditure, will grow over time. This is particularly the case for personnel and commodities, less so for programme costs.

Of these additional costs, 13% are for programme development and support, 87% for service delivery (roughly three quarters for service delivery through health facilities and one quarter for community level interventions). Of the extra service delivery costs, 38% are for salaries and honorariums for the professional staff, 10% for community health worker programmes to complement the services provided by the professional health care workers, and 39% for drugs, lab tests and other supplies.

The distribution of these additional costs over different interventions changes over time. In absolute terms, the projections assume roughly a tenfold increase between 2006 and 2015 in resource requirements for counselling for breastfeeding and complementary feeding, as well as for case management of neonatal infections, diarrhoea and acute respiratory infections. The additional resources required to scale up immunization and target malaria will double over the same period, but their share of the total would be reduced by two thirds to 9% and 12%, respectively. Only treatment of complications of measles would require less funding in 2015 than in 2006: prevention pays off in the long run.





In any event, the institutional capacity will have to be created not only to mobilize such funds, but also to plan and implement the integration of the various interventions, and to complete the reorientation of child health services from solely survival to survival, growth and development. This cannot be done in isolation from the development and strengthening of health systems. First, health services need to be able to provide care that addresses multiple risks and conditions, and for this they have to rely on well functioning health systems that ensure a continuum of care between the home, first-level facilities and district hospitals. Second, it cannot be done without establishing a better continuity with the interventions aimed at improving maternal and newborn health. Third, it requires a cultural revolution among health workers to start working with households and communities as partners, and to look at children as children, and not merely as a collection of diseases.

The evolution within child health programmes – from the comprehensive view of early primary health care, over the interim strategies of selective interventions targeting priority disease, to today's more comprehensive integrated management of childhood illness – reflects the awareness that successful strategies to improve child survival are likely to involve a combination of approaches that move towards greater integration. Without it, too many children will not reach services or, when they do, too many opportunities to protect their health will be missed. Many countries have already started to reorient their services to build or strengthen this continuum of care. It is now up to governments and the global community to support these efforts, and to mobilize resources accordingly.

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